SEQUENCE LISTING

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Rechts
Ponstingl, Herwig
Zimmermann, Hans-Peter
Marmé, Alexander
Bastert, Gunther
Kurek, Raffael
Wallwiener, Diethelm

<120> Drop1, a novel marker for carcinomas

<130> K 3176

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<141> 2004-04-02

<150> EP 03007680.6
<151> 2003-04-03

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<170> PatentIn version 3.2

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cctcgaagga agaaagatta aattagtcaa cattaactcc accgatatag ctgatggccg    360

accctcaata gttcttggat tgatgtggac cattattcta tatttccaga ttgaagagtt    420

gaccagcaac ctgccccagc tccagtcttt gtccagcagc gcatcctccg tggacagcat    480

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aaatgctaag aaggctttat taaagtgggt tcagtacaca gctggcaagc agactggaat    600

agaagtaaaa gattttggga agagttggag aagcggggtt gcctttcatt cagttattca    660

tgccattcga ccggaattgg tggacttgga gacagtgaaa ggcagatcca accgagaaaa    720
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tctgaaacat tatcctgaca tccacaatgc aagcactgat gggcaagagg atgatagaga      900

agacagagta atttttaagg aaatgaaagt ttggatagaa caatttgaga gagatttgac      960

aagagcacag atggtggaat caaatttaca ggataaatat cagtcattta agcacttcag     1020

agttcaatat gaaatgaaga ggaaacagat tgaacattta atacaaccat tacacagaga     1080

cggtaaattg tcacttgacc aagcattggt aaaacaatct tgggatagag tgacctccag     1140

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cc                                                                    1202


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<213>  Homo sapiens

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<213>  Homo sapiens

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<210>  15
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<212>  DNA
<213>  Homo sapiens

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accattacac agagacggta aattgtcact tgaccaagca ttggtaaaac aatcttggga      180

tagagtgacc tccaggctct ttgactggca tatacagctt gataaatctc ttcctgcacc      240

tctgggcacc ataggtgcct ggctgtacag agcggaggtg gccctgagag aggaaataac      300

cgttcaacag gtccacgagg aaacagcaaa cacgatacaa cggaaacttg agcaacataa      360

ggatctgctt caaaacacgg atgcccacaa aagagcattc catgaaatct accggaccag      420

gtctgttaac gggattccag tgccacctga tcaattagag gacatggccg agaggtttca      480

ttttgtttcc tccacatcag agctacacct aatgaaaatg gaattttttag aattaaagta      540

ccgtctgctc tcactgctgg ttcttgcaga gtcaaagctg aagtcttgga tcattaagta      600
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caccgctcag tggaggaatc tctcagtaga agtgaggagt gtgaggagca tgctggaaga      840

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acctcattgg attcagcagc atactgccat gaacgatgct ggcaatttc taattgaaac     1020

ctgtgatgag atggtttccc gtgacctgaa gcagcaatta ctgttgctaa atgggcggtg     1080

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actttctgaa cccttagaag tctctttat gaatgtcaag ctattaattc aagacttgga     1260

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gaagtttgag gagtctcgag cagagttgga gaaggtactg cggattgctc aggagggcct     1860

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agagcaggag cagcaggggc tgcaggaagc tgttcgaaag ctccacaaac aatggaagga     2040

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ccaggaaggc agtgaaaaga taattaaaga gcacagggtt ttcttcagtg acaaaggtcc     2220

tcatcatctc tgtgagaaaa ggttacagct catcgaggaa ctctgtgtga aactcccagt     2280

gcgggaccca gtaagggaca cacctggaac ctgtcacgtg actctcaaag agctcagagc     2340

tgccattgac agcacctaca ggaagctcat ggaagaccca gacaagtgga aggactacac     2400

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<212> DNA
<213> Homo sapiens

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catggaagac ccagacaagt ggaaggacta cactagcaga ttctctgagt tctcatcttg   180

gatatctaca aatgagacac aattaaaggg gatcaagggt gaggccatcg atactgccaa   240

ccacggagag gttaaacgtg ccgttgaaga gatcagaaat ggtgttacca aaaggggtga   300

gaccctcagc tggctgaaat ccaggctgaa agttttgaca gaagtttctt ctgagaatga   360

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tgagaagatc ttggatactg aaaatctgtt tgaagcacag cagttacttc ttcatcacca   600

gcaaaagaca aagcggatcc cagcaaagaa gagagatgtg cagcagcaga tcgcgcaggc   660

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tgtaaaggaa gcttcagaga taccgcttgg gccccaaaat aagcagctgc ttcaacagca   1020

ggccaagtca atcaaagaac aagtcaaaaa attagaagac acgcttgaag aagatattaa   1080

aaccatggaa atggtgaaaa ccaagtggga tcattttggc agtaattttg agactctgtc   1140

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ggacatgcaa atcagccaaa ttaaggtcac aattcaggaa atagaaagta agctcagcag   1260

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tgcacagtgt ctggaaggaa caatcctggg acatttatct cagcagcaaa agtttgaaga   1440

gaaccttaga aagatccagc aatctgtgtc tgaatttgaa gataaacttg ctgttccaat   1500

taaaatatgt tcttcagcta cagaaacata caaagttctt caagaacata tggatctctg   1560

ccaggccctg gagtcactga gcagcgcgat cactgccttc tcagccagtg ccaggaaggt   1620

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ccacctcctg cagggaaagg ctgaggactg cttccagctg tttgaggagg ccagccgggt    2340

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tctgtccggc attctccgcc agctgaggca aacagtggaa gcaaccaaca gtatgaataa    2460

gaacgagtct gatttgatag aaaaggacct caatgatgct cttcaaaatg ctaaagcatt    2520

agaatctgct gccgtcagtc tggatgggcc c                                   2551
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<211> 1120
<212> DNA
<213> Homo sapiens

<400> 17
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cagaaatgga catttctgca gacagagtca aagtggaagg tgaacttcag ttaatacagg    180

cactgcaaaa tgaagttgta tcccaggcct cattctatag caaactttttg caattgaagg    240

aatcattgtt ctcagtagcc tccaaagatg atgtgaaaat gatgaaacta catttggagc    300

agttggatga gagatggaga gatttaccac agatcattaa caaaaggatt aattttcttc    360

agtctgtggt tgctgaacac cagcaatttg atgagctgct gctttccttt tctgtctgga    420

ttaaactgtt tctcagtgaa ttacaaacta cctctgagat tagcataatg gaccatcaag    480

tagcccttac tcggcataag gaccacgcag cagaagtaga gagcaaaaag ggcgaattgc    540

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agaggcggca gcttgccctg tcccatttgg cagaattcct ccagagccat gcctctctgt    720
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ccggcattct ccgccagctg aggcaaacag tggaagcaac caacagtatg aataagaacg     780

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gctctgagca aaggacttcc tgcagagcca cggctgatca gctctgtgga gaggtagaga     960

ggatccagaa ccttctggga accaagcaga gtgaggcaga tgctctggca gtgttgaaaa    1020

aagcattcca agaccagaaa gaggagcttc tgaaaagcat tgaggacatt gaagaaagga    1080

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<211>  1601
<212>  DNA
<213>  Homo Sapiens

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caagcagagt gaggcagatg ctctggcagt gttgaaaaaa gcattccaag accagaaaga     180

ggagcttctg aaaagcattg aggacattga agaaaggact gacaaagagc gattgaaaga     240

acctacccgc caagctcttc agcagaggtt aagagtgttt aatcagctag aagatgaatt     300

gaattctcac gagcatgaac tatgttggtt gaaagacaaa gccaagcaaa ttgcccagaa     360

agatgtagct tttgcacctg aagttgacag ggagataaac cgcttagagg tcacctggga     420

tgataccaaa agactaattc atgaaaatca gggtcagtgc tgtggactta ttgacttaat     480

gagagaatat cagaacctga aatcagctgt atctaaagtc ttagaaaatg ccagcagtgt     540

gattgtaacc agaactacca taaaagatca ggaggatctt aaatgggctt tttccaagca     600

tgaaactgcc aagaacaaaa tgaattacaa acagaaagac ttggataact ttaccagcaa     660

aggaaaacac ttgttatctg agctgaagaa aattcacagt agtgatttca gcttggtgaa     720

aacagacatg gagagcaccg tggacaaatg gctggatgta tcagagaaac ttgaagaaaa     780

catggatagg ctgagagtaa gcctgtccat ttggggtgat gtactgtcaa ctagagatga     840

gattgaggga tggtcaaaca actgcgttcc acagatggca gaaaacatca gcaacctgga     900

taaccacctc agagctgaag aactgcttaa gaatttgag tctgaagtta aaaacaaagc     960

attgagattg gaagaactgc attccaaagt taatgatctg aaagaattaa ctaaaaatct    1020

agaaacaccg ccagaccttc agtttataga agcagactta atgcagaaac tggagcatgc    1080

caaagaaata actgaagtag caaaaggaac cctgaaggat ttcacggctc aaagtacaca    1140

agtggagaag tttattaatg acataacaac atggttcaca aaagtggaag aatcgttgat    1200

gaactgtgcc caaaatgaga cttgtgaagc attgaaaaaa gtcaaggata tacaaaaaga    1260
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acttcaaagt caacaaagca acatcagctc tacccaagaa aatctcaata gcttgtgccg    1320

caagtaccac tcagctgagt tggagagcct gggccgtgca atgactggtc tgataaagaa    1380

acatgaagcc gtgagccagt tgtgctccaa aacccaggcc agcctgcagg aatctctgga    1440

aaaacacttc agtgagtcta tgcaggaatt ccaagaatgg ttttttgggag caaaggcagc    1500

agcaaaagaa tcatcagatc gcaccggtga cagcaaagtt ctagaagcaa agctccatga    1560

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<210> 19
<211> 1694
<212> DNA
<213> Homo sapiens

<400> 19
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aagaatggtt tttgggagca aaggcagcag caaaagaatc atcagatcgc accggtgaca     180

gcaaagttct agaagcaaag ctccatgatc ttcagaacat tttggactca gtcagtgatg     240

ggcagagcaa acttgatgca gtgactcaag aaggacaaac tttgtatgca catttgtcta     300

aacaaattgt cagtagcatt caagaacaaa tcacaaaggc caatgaagag tttcaagcat     360

ttctgaaaca atgccttaaa gataagcagg ctcttcaaga ctgtgcttca gaacttggaa     420

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atacggaaaa cttgggagag agtaaacagc acattcctga gaagaaaaat gaagttcata     540

aagttgaaat gttttttggga gaactgctgg ctgcaagaga gtctcttgat aagctttccc     600

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cccagctcct cacaagccac cagaacctac ttagaatgac caaagagaaa ctccggagct     720

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ccctggagaa acggctgtca caaatacagg atattctcct gatgaaaggt gaaggggaag     900

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gtcagagggt gattcagact cagttagaga cccttaaaga agtgtgggct gacatcatga    1020

gctcctccgt ccacgctcaa agcactttag agtctgtgat tagccaatgg aatgactatg    1080

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cacagtttaa tgatataatg actgttgcca aggaaaaaat gaggaaagtg gaagagattg    1380

tgaaagatca tctaatgtat ttagatgcgg tccacgagtt cacagattgg ctccattcag    1440

caaaggaaga acttcaccgg tggtcagata tgtctggaga ttcatcagcc acccagaaaa    1500

agttatcaaa aattaaggag ctgatagatt ccagagagat tggtgcaagc cgtctcagca    1560

gagtggagtc gctggctccc gaagtgaaac agaacacaac tgccagtggg tgtgagctca    1620

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<211> 1505
<212> DNA
<213> Homo sapiens

<400> 20
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ctgggtgaag gccattcagg acagactggc ctgtgcagag agcactcttg ggagcaaaga     180

caccctggag aaacggctgt cacaaataca ggatattctc ctgatgaaag gtggagggga     240

agttaagttg aatatggcca ttggcaaggg ggaacaggcc ttgagaagta gcaacaaaga     300

aggtcagagg gtgattcaga ctcagttaga gacccttaaa gaagtgtggg ctgacatcat     360

gagctcctcc gtccacgctc aaagcacttt agagtctgtg attagccaat ggaatgacta     420

tgtagagagg aaaaaccagt tggagcagtg gatggaatca gtggatcaaa aaatagaaca     480

tcccttacaa ccacagccag gtctgaaaga gaagttcgtc ctgcttgacc acctccagtc     540

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ggagctctac gaaaagacag aggatgagtc tttcaaggac acagctcaag aggagctgaa     660

aacacagttt aatgatataa tgactgttgc caaggaaaaa atgaggaaag tggaagagat     720

tgtgaaagat catctaatgt atttagatgc ggtccacgag ttcacagatt ggctccattc     780

agcaaaggaa gaacttcacc ggtggtcaga tatgtctgga gattcatcag ccacccagaa     840

aaagttatca aaaattaagg agctgataga ttccagagag attggtgcaa gccgtctcag     900

cagagtggag tcgctggctc ccgaagtgaa acagaacaca actgccagtg ggtgtgagct     960

catgcacacg gagatgcagg ccctgcgtgc cgactggaag cagtgggaag acagtgtatt    1020

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gatatttta tacaaattag aagctagaag tttattttaa ggtgtaattt caaaataata   1440

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ccggg   1505

<210>   21
<211>   681
<212>   DNA
<213>   Homo sapiens

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cttcaggagc acgaagccct ggaggaagca ctgcaaagca tgtggttctg ggtgaaggcc   120

attcaggaca gactggcctg tgcagagagc actcttggga gcaaagacac cctggagaaa   180

cggctgtcac aaatacagga tattctcctg atgaaaggtg aaggggaagt taagttgaat   240

atggccattg gcaaggggga acaggccttg agaagtagca caaagaagg tcagagggtg   300

attcagactc agttagagac ccttaaagaa gtgtgggctg acatcatgag ctcctccgtc   360

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gatataatga ctgttgccaa a   681

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<212>   DNA
<213>   Homo sapiens

<400>   22
ctggagaaac ggctgtcaca aata   24

<210>   23
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<212>   DNA
<213>   Homo sapiens

<400>   23
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<210>   24
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aaggagctga tagattccag agagattggt gcaagccgtc tcagcagagt ggagtcgctg   180

gctcccgaag tgaaacagaa cacaactgcc agtgggtgtg agctcatgca cacggagatg   240

caggccctgc gtgccgactg gaagcagtgg gaagacagtg tattccaaac gcagagctgt   300

ttggagaacc tggtcagcca gatggccctt tcggagcagg aattctcagg ccaagtggct   360

caactggagc aggccctgga acagttcagt gcccttctga aaacctgggc tcagcagtta   420

accctcctgg aaggcaagaa cacggatgag gagatagtgg aatgctggca caaaggacaa   480

gagatactgg atgctttgca aaaagcagag cctagaacag aggatctcaa gtctcagctg   540

aatgaacttt gtcgattttc cagagacctg agtacctaca gtggaaaagt ttctggcttg   600

attaaagagt ataattggtg agcatgaacc ttattggtgt tcaagatatt tttatacaaa   660

ttagaagcta gaagtttatt ttaaggtgta atttcaaaat aatattagtt cagcattaaa   720

tatattacta agtgaggtaa gtgcacattc taagaactgg tgattctatc aaacatgatt   780

ttcatcaact ttatcgcttt ttcctgccat taaatttttg cgtcaccttt tcagtctttg   840

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ggccttcagg gatttccagc agtggttggt taatgcaaaa atcactaccg ccaagtgttt   960

tgatatacct caaaatataa gtgaagtttc aactagtctt cagaaaatac aggtaagggt   1020

gttatcaatt aattctagta gcagtgctga tgtgaactaa agttaacctc taaatcaagg   1080

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gccctgcgtg ccgactggaa gcagtgggaa gacagtgtat tccaaacgca gagctgtttg   180

gagaacctgg tcagccagat ggccctttcg gagcaggaat tctcaggcca agtggctcaa   240

ctggagcagg ccctggaaca gttcagtgcc cttctgaaaa cctgggctca gcagttaacc   300

ctcctggaag gcaagaacac ggatgaggag atagtggaat gctggcacaa aggacaa   357

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<213>  Homo sapiens

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aatgaacttt gtcgattttc cagagacctg agtacctaca gtggaaaagt ttctggcttg     120

attaaagagt ataattg                                                    137


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gagtacctac agtggaaaag tttctggctt gattaaagag tataattggt gagcatgaac     180

cttattggtg ttcaagatat ttttatacaa attagaagct agaagtttat tttaaggtgt     240

aatttcaaaa taatattagt tcagcattaa atatattact aagtgaggta agtgcacatt     300

ctaagaactg gtgattctat caaacatgat tttcatcaac tttatcgctt tttcctgcca     360

ttaaattttt gcgtcacctt ttcagtcttt gtttgcaagc atccaagggc tgccagaata     420

aagaacagat tttacagcaa agatttcgaa aggccttcag ggatttccag cagtggttgg     480

ttaatgcaaa aatcactacc gccaagtgtt ttgatatacc tcaaaatata agtgaagttt     540

caactagtct tcagaaaata caggtaaggg tgttatcaat taattctagt agcagtgctg     600

atgtgaacta aagttaacct ctaaatcaag ggtccccatc tcctgggccg cggactggta     660

caggtccctg gcctgttagg aaccaggccg cacagcagga ggtgagcagc aggccaatga     720

gcgttactgc ctgagctcca cctcctgtca gatcagcggt agcatcagat tctcatagga     780

gcctgaaccc cattgtgaac tgtgcacaca gaggaactag gctgtgtgct ccttctaaga     840

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<213>  Homo sapiens

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attaaagagt ataattggtg agcatgaacc ttattggtgt tcaagatatt tttatacaaa     180

ttagaagcta gaagtttatt ttaaggtgta atttcaaaat aatattagtt cagcattaaa     240

tatattacta agtgaggtaa gtgcacattc taagaactgg tgattctatc aaacatgatt     300
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ttcatcaact ttatcgcttt ttcctgccat taaattttg cgtcacctt tcagtcttg      360

tttgcaagca tccaagggct gccagaataa agaacagatt ttacagcaaa gatttcgaaa     420

ggccttcagg gatttccagc agtggttggt taatgcaaaa atcactaccg ccaagtgttt     480

tgatatacct caaaatataa gtgaagtttc aactagtctt cagaaaatac aggtaagggt     540

gttatcaatt aattctagta gcagtgctga tgtgaactaa agttaacctc taaatcaagg     600

gtccccatct cctgggccgc ggactggtac aggtccctgg cctgttagga accaggccgc     660

acagcaggag gtgagcagca ggccaatgag cgttactgcc tgagctccac ctcctgtcag     720

atc                                                                   723
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tcgaaaggcc ttcagggatt ccagcagtg gttggttaat gcaaaaatca ctaccgccaa     120

gtgttttgat atacctcaaa atataagtga agtttcaact agtcttcaga aaatacag      178
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<212>   PRT
<213>   Homo sapiens

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                20                  25                  30


Phe Thr Lys Trp Ile Asn Ser His Leu Ala Lys Arg Lys Pro Pro Met
            35                  40                  45


Val Val Asp Asp Leu Phe Glu Asp Met Lys Asp Gly Val Lys Leu Leu
        50                  55                  60


Ala Leu Leu Glu Val Leu Ser Gly Gln Lys Leu Pro Cys Glu Gln Gly
65                  70                  75                  80


Arg Arg Met Lys Arg Ile His Ala Val Ala Asn Ile Gly Thr Ala Leu
                85                  90                  95


Lys Phe Leu Glu Gly Arg Lys Ile Lys Leu Val Asn Ile Asn Ser Thr
                            Page 20
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            100                   105          110

Asp Ile Ala Asp Gly Arg Pro Ser Ile Val Leu Gly Leu Met Trp Thr
        115             120             125

Ile Ile Leu Tyr Phe Gln Ile Glu Glu Leu Thr Ser Asn Leu Pro Gln
        130             135             140

Leu Gln Ser Leu Ser Ser Ser Ala Ser Ser Val Asp Ser Ile Val Ser
145             150             155             160

Ser Glu Thr Pro Ser Pro Pro Ser Lys Arg Lys Val Thr Thr Lys Ile
                165             170             175

Gln Gly Asn Ala Lys Lys Ala Leu Leu Lys Trp Val Gln Tyr Thr Ala
            180             185             190

Gly Lys Gln Thr Gly Ile Glu Val Lys Asp Phe Gly Lys Ser Trp Arg
            195             200             205

Ser Gly Val Ala Phe His Ser Val Ile His Ala Ile Arg Pro Glu Leu
    210             215             220

Val Asp Leu Glu Thr Val Lys Gly Arg Ser Asn Arg Glu Asn Leu Glu
225             230             235             240

Asp Ala Phe Thr Ile Ala Glu Thr Glu Leu Gly Ile Pro Arg Leu Leu
            245             250             255

Asp Pro Glu Asp Val Asp Val Asp Lys Pro Asp Glu Lys Ser Ile Met
            260             265             270

Thr Tyr Val Ala Gln Phe Leu Lys His Tyr Pro Asp Ile His Asn Ala
    275             280             285

Ser Thr Asp Gly Gln Glu Asp Asp Arg Glu Asp Arg Val Ile Phe Lys
    290             295             300

Glu Met Lys Val Trp Ile Glu Gln Phe Glu Arg Asp Leu Thr Arg Ala
305             310             315             320

Gln Met Val Glu Ser Asn Leu Gln Asp Lys Tyr Gln Ser Phe Lys His
            325             330             335

Phe Arg Val Gln Tyr Glu Met Lys Arg Lys Gln Ile Glu His Leu Ile
            340             345             350
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Gln Pro Leu His Arg Asp Gly Lys Leu Ser Leu Asp Gln Ala Leu Val
        355   360   365

Lys Gln Ser Trp Asp Arg Val Thr Ser Arg Leu Phe Asp Trp His Ile
        370   375   380

Gln Leu Asp Lys Ser Leu Pro Ala Pro Leu Gly Thr Ile Gly Ala Trp
385   390   395   400

Leu Tyr Arg Ala Glu Val Ala Leu Arg Glu Glu Ile Thr Val Gln Gln
                405   410   415

Val His Glu Glu Thr Ala Asn Thr Ile Gln Arg Lys Leu Glu Gln His
                420   425   430

Lys Asp Leu Leu Gln Asn Thr Asp Ala His Lys Arg Ala Phe His Glu
        435   440   445

Ile Tyr Arg Thr Arg Ser Val Asn Gly Ile Pro Val Pro Pro Asp Gln
        450   455   460

Leu Glu Asp Met Ala Glu Arg Phe His Phe Val Ser Ser Thr Ser Glu
465   470   475   480

Leu His Leu Met Lys Met Glu Phe Leu Glu Leu Lys Tyr Arg Leu Leu
                485   490   495

Ser Leu Leu Val Leu Ala Glu Ser Lys Leu Lys Ser Trp Ile Ile Lys
                500   505   510

Tyr Gly Arg Arg Glu Ser Val Glu Gln Leu Leu Gln Asn Tyr Val Ser
        515   520   525

Phe Ile Glu Asn Ser Lys Phe Phe Glu Gln Tyr Glu Val Thr Tyr Gln
        530   535   540

Ile Leu Lys Gln Thr Ala Glu Met Tyr Val Lys Ala Asp Gly Ser Val
545   550   555   560

Glu Glu Ala Glu Asn Val Met Lys Phe Met Asn Glu Thr Thr Ala Gln
                565   570   575

Trp Arg Asn Leu Ser Val Glu Val Arg Ser Val Arg Ser Met Leu Glu
                580   585   590

Glu Val Ile Ser Asn Trp Asp Arg Tyr Gly Asn Thr Val Ala Ser Leu
        595   600   605

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Gln Ala Trp Leu Glu Asp Ala Glu Lys Met Leu Asn Gln Ser Glu Asn
    610   615   620

Ala Lys Lys Asp Phe Phe Arg Asn Leu Pro His Trp Ile Gln Gln His
625   630   635   640

Thr Ala Met Asn Asp Ala Gly Asn Phe Leu Ile Glu Thr Cys Asp Glu
            645   650   655

Met Val Ser Arg Asp Leu Lys Gln Gln Leu Leu Leu Leu Asn Gly Arg
            660   665   670

Trp Arg Glu Leu Phe Met Glu Val Lys Gln Tyr Ala Gln Ala Asp Glu
        675   680   685

Met Asp Arg Met Lys Lys Glu Tyr Thr Asp Cys Val Val Thr Leu Ser
    690   695   700

Ala Phe Ala Thr Glu Ala His Lys Lys Leu Ser Glu Pro Leu Glu Val
705   710   715   720

Ser Phe Met Asn Val Lys Leu Leu Ile Gln Asp Leu Glu Asp Ile Glu
            725   730   735

Gln Arg Val Pro Val Met Asp Ala Gln Tyr Lys Ile Ile Thr Lys Thr
            740   745   750

Ala His Leu Ile Thr Lys Glu Ser Pro Gln Glu Glu Gly Lys Glu Met
        755   760   765

Phe Ala Thr Met Ser Lys Leu Lys Glu Gln Leu Thr Lys Val Lys Glu
    770   775   780

Cys Tyr Ser Pro Leu Leu Tyr Glu Ser Gln Gln Leu Leu Ile Pro Leu
785   790   795   800

Glu Glu Leu Glu Lys Gln Met Thr Ser Phe Tyr Asp Ser Leu Gly Lys
            805   810   815

Ile Asn Glu Ile Ile Thr Val Leu Glu Arg Glu Ala Gln Ser Ser Ala
            820   825   830

Leu Phe Lys Gln Lys His Gln Glu Leu Leu Ala Cys Gln Glu Asn Cys
        835   840   845

Lys Lys Thr Leu Thr Leu Ile Glu Lys Gly Ser Gln Ser Val Gln Lys
    850   855   860

Phe Val Thr Leu Ser Asn Val Leu Lys His Phe Asp Gln Thr Arg Leu
865   870   875   880

Gln Arg Gln Ile Ala Asp Ile His Val Ala Phe Gln Ser Met Val Lys
                885   890   895

Lys Thr Gly Asp Trp Lys Lys His Val Glu Thr Asn Ser Arg Leu Met
            900   905   910

Lys Lys Phe Glu Glu Ser Arg Ala Glu Leu Glu Lys Val Leu Arg Ile
        915   920   925

Ala Gln Glu Gly Leu Glu Glu Lys Gly Asp Pro Glu Glu Leu Leu Arg
    930   935   940

Arg His Thr Glu Phe Phe Ser Gln Leu Asp Gln Arg Val Leu Asn Ala
945   950   955   960

Phe Leu Lys Ala Cys Asp Glu Leu Thr Asp Ile Leu Pro Glu Gln Glu
            965   970   975

Gln Gln Gly Leu Gln Glu Ala Val Arg Lys Leu His Lys Gln Trp Lys
        980   985   990

Asp Leu Gln Gly Glu Ala Pro Tyr His Leu Leu His Leu Lys Ile Asp
        995   1000   1005

Val Glu Lys Asn Arg Phe Leu Ala Ser Val Glu Glu Cys Arg Thr
    1010   1015   1020

Glu Leu Asp Arg Glu Thr Lys Leu Met Pro Gln Glu Gly Ser Glu
    1025   1030   1035

Lys Ile Ile Lys Glu His Arg Val Phe Phe Ser Asp Lys Gly Pro
    1040   1045   1050

His His Leu Cys Glu Lys Arg Leu Gln Leu Ile Glu Glu Leu Cys
    1055   1060   1065

Val Lys Leu Pro Val Arg Asp Pro Val Arg Asp Thr Pro Gly Thr
    1070   1075   1080

Cys His Val Thr Leu Lys Glu Leu Arg Ala Ala Ile Asp Ser Thr
    1085   1090   1095

Tyr Arg Lys Leu Met Glu Asp Pro Asp Lys Trp Lys Asp Tyr Thr
Page 24

1100   1105   1110

Ser Arg Phe Ser Glu Phe Ser Ser Trp Ile Ser Thr Asn Glu Thr
    1115   1120   1125

Gln Leu Lys Gly Ile Lys Gly Glu Ala Ile Asp Thr Ala Asn His
    1130   1135   1140

Gly Glu Val Lys Arg Ala Val Glu Glu Ile Arg Asn Gly Val Thr
    1145   1150   1155

Lys Arg Gly Glu Thr Leu Ser Trp Leu Lys Ser Arg Leu Lys Val
    1160   1165   1170

Leu Thr Glu Val Ser Ser Glu Asn Glu Ala Gln Lys Gln Gly Asp
    1175   1180   1185

Glu Leu Ala Lys Leu Ser Ser Ser Phe Lys Ala Leu Val Thr Leu
    1190   1195   1200

Leu Ser Glu Val Glu Lys Met Leu Ser Asn Phe Gly Asp Cys Val
    1205   1210   1215

Gln Tyr Lys Glu Ile Val Lys Asn Ser Leu Glu Glu Leu Ile Ser
    1220   1225   1230

Gly Ser Lys Glu Val Gln Glu Gln Ala Glu Lys Ile Leu Asp Thr
    1235   1240   1245

Glu Asn Leu Phe Glu Ala Gln Gln Leu Leu Leu His His Gln Gln
    1250   1255   1260

Lys Thr Lys Arg Ile Ser Ala Lys Lys Arg Asp Val Gln Gln Gln
    1265   1270   1275

Ile Ala Gln Ala Gln Gln Gly Glu Gly Gly Leu Pro Asp Arg Gly
    1280   1285   1290

His Glu Glu Leu Arg Lys Leu Glu Ser Thr Leu Asp Gly Leu Glu
    1295   1300   1305

Arg Ser Arg Glu Arg Gln Glu Arg Arg Ile Gln Val Thr Leu Arg
    1310   1315   1320

Lys Trp Glu Arg Phe Glu Thr Asn Lys Glu Thr Val Val Arg Tyr
    1325   1330   1335

Leu Phe Gln Thr Gly Ser Ser His Glu Arg Phe Leu Ser Phe Ser
1340   1345   1350

Ser Leu Glu Ser Leu Ser Ser Glu Leu Glu Gln Thr Lys Glu Phe
1355   1360   1365

Ser Lys Arg Thr Glu Ser Ile Ala Val Gln Ala Glu Asn Leu Val
1370   1375   1380

Lys Glu Ala Ser Glu Ile Pro Leu Gly Pro Gln Asn Lys Gln Leu
1385   1390   1395

Leu Gln Gln Gln Ala Lys Ser Ile Lys Glu Gln Val Lys Lys Leu
1400   1405   1410

Glu Asp Thr Leu Glu Glu Asp Ile Lys Thr Met Glu Met Val Lys
1415   1420   1425

Thr Lys Trp Asp His Phe Gly Ser Asn Phe Glu Thr Leu Ser Val
1430   1435   1440

Trp Ile Thr Glu Lys Glu Lys Glu Leu Asn Ala Leu Glu Thr Ser
1445   1450   1455

Ser Ser Ala Met Asp Met Gln Ile Ser Gln Ile Lys Val Thr Ile
1460   1465   1470

Gln Glu Ile Glu Ser Lys Leu Ser Ser Ile Val Gly Leu Glu Glu
1475   1480   1485

Glu Ala Gln Ser Phe Ala Gln Phe Val Thr Thr Gly Glu Ser Ala
1490   1495   1500

Arg Ile Lys Ala Lys Leu Thr Gln Ile Arg Arg Tyr Gly Glu Glu
1505   1510   1515

Leu Arg Glu His Ala Gln Cys Leu Glu Gly Thr Ile Leu Gly His
1520   1525   1530

Leu Ser Gln Gln Gln Lys Phe Glu Glu Asn Leu Arg Lys Ile Gln
1535   1540   1545

Gln Ser Val Ser Glu Phe Glu Asp Lys Leu Ala Val Pro Ile Lys
1550   1555   1560

Ile Cys Ser Ser Ala Thr Glu Thr Tyr Lys Val Leu Gln Glu His
1565   1570   1575

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Met Asp Leu Cys Gln Ala Leu Glu Ser Leu Ser Ser Ala Ile Thr
1580   1585   1590

Ala Phe Ser Ala Ser Ala Arg Lys Val Val Asn Arg Asp Ser Cys
1595   1600   1605

Val Gln Glu Ala Ala Ala Leu Gln Gln Gln Tyr Glu Asp Ile Leu
1610   1615   1620

Arg Arg Ala Lys Glu Arg Gln Thr Ala Leu Glu Asn Leu Leu Ala
1625   1630   1635

His Trp Gln Arg Leu Glu Lys Glu Leu Ser Ser Phe Leu Thr Trp
1640   1645   1650

Leu Glu Arg Gly Glu Ala Lys Ala Ser Ser Pro Glu Met Asp Ile
1655   1660   1665

Ser Ala Asp Arg Val Lys Val Glu Gly Glu Leu Gln Leu Ile Gln
1670   1675   1680

Ala Leu Gln Asn Glu Val Val Ser Gln Ala Ser Phe Tyr Ser Lys
1685   1690   1695

Leu Leu Gln Leu Lys Glu Ser Leu Phe Ser Val Ala Ser Lys Asp
1700   1705   1710

Asp Val Lys Met Met Lys Leu His Leu Glu Gln Leu Asp Glu Arg
1715   1720   1725

Trp Arg Asp Leu Pro Gln Ile Ile Asn Lys Arg Ile Asn Phe Leu
1730   1735   1740

Gln Ser Val Val Ala Glu His Gln Gln Phe Asp Glu Leu Leu Leu
1745   1750   1755

Ser Phe Ser Val Trp Ile Lys Leu Phe Leu Ser Glu Leu Gln Thr
1760   1765   1770

Thr Ser Glu Ile Ser Ile Met Asp His Gln Val Ala Leu Thr Arg
1775   1780   1785

His Lys Asp His Ala Ala Glu Val Glu Ser Lys Lys Gly Glu Leu
1790   1795   1800

Gln Ser Leu Gln Gly His Leu Ala Lys Leu Gly Ser Leu Gly Arg
1805   1810   1815

Ala Glu Asp Leu His Leu Leu Gln Gly Lys Ala Glu Asp Cys Phe
    1820   1825   1830

Gln Leu Phe Glu Glu Ala Ser Gln Val Val Glu Arg Arg Gln Leu
    1835   1840   1845

Ala Leu Ser His Leu Ala Glu Phe Leu Gln Ser His Ala Ser Leu
    1850   1855   1860

Ser Gly Ile Leu Arg Gln Leu Arg Gln Thr Val Glu Ala Thr Asn
    1865   1870   1875

Ser Met Asn Lys Asn Glu Ser Asp Leu Ile Glu Lys Asp Leu Asn
    1880   1885   1890

Asp Ala Leu Gln Asn Ala Lys Ala Leu Glu Ser Ala Ala Val Ser
    1895   1900   1905

Leu Asp Gly Ile Leu Ser Lys Ala Gln Tyr His Leu Lys Ile Gly
    1910   1915   1920

Ser Ser Glu Gln Arg Thr Ser Cys Arg Ala Thr Ala Asp Gln Leu
    1925   1930   1935

Cys Gly Glu Val Glu Arg Ile Gln Asn Leu Leu Gly Thr Lys Gln
    1940   1945   1950

Ser Glu Ala Asp Ala Leu Ala Val Leu Lys Lys Ala Phe Gln Asp
    1955   1960   1965

Gln Lys Glu Glu Leu Leu Lys Ser Ile Glu Asp Ile Glu Glu Arg
    1970   1975   1980

Thr Asp Lys Glu Arg Leu Lys Glu Pro Thr Arg Gln Ala Leu Gln
    1985   1990   1995

Gln Arg Leu Arg Val Phe Asn Gln Leu Glu Asp Glu Leu Asn Ser
    2000   2005   2010

His Glu His Glu Leu Cys Trp Leu Lys Asp Lys Ala Lys Gln Ile
    2015   2020   2025

Ala Gln Lys Asp Val Ala Phe Ala Pro Glu Val Asp Arg Glu Ile
    2030   2035   2040

Asn Arg Leu Glu Val Thr Trp Asp Asp Thr Lys Arg Leu Ile His

2045   2050   2055

Glu Asn Gln Gly Gln Cys Cys Gly Leu Ile Asp Leu Met Arg Glu
    2060   2065   2070

Tyr Gln Asn Leu Lys Ser Ala Val Ser Lys Val Leu Glu Asn Ala
    2075   2080   2085

Ser Ser Val Ile Val Thr Arg Thr Thr Ile Lys Asp Gln Glu Asp
    2090   2095   2100

Leu Lys Trp Ala Phe Ser Lys His Glu Thr Ala Lys Asn Lys Met
    2105   2110   2115

Asn Tyr Lys Gln Lys Asp Leu Asp Asn Phe Thr Ser Lys Gly Lys
    2120   2125   2130

His Leu Leu Ser Glu Leu Lys Lys Ile His Ser Ser Asp Phe Ser
    2135   2140   2145

Leu Val Lys Thr Asp Met Glu Ser Thr Val Asp Lys Trp Leu Asp
    2150   2155   2160

Val Ser Glu Lys Leu Glu Glu Asn Met Asp Arg Leu Arg Val Ser
    2165   2170   2175

Leu Ser Ile Trp Asp Asp Val Leu Ser Thr Arg Asp Glu Ile Glu
    2180   2185   2190

Gly Trp Ser Asn Asn Cys Val Pro Gln Met Ala Glu Asn Ile Ser
    2195   2200   2205

Asn Leu Asp Asn His Leu Arg Ala Glu Glu Leu Leu Lys Glu Phe
    2210   2215   2220

Glu Ser Glu Val Lys Asn Lys Ala Leu Arg Leu Glu Glu Leu His
    2225   2230   2235

Ser Lys Val Asn Asp Leu Lys Glu Leu Thr Lys Asn Leu Glu Thr
    2240   2245   2250

Pro Pro Asp Leu Gln Phe Ile Glu Ala Asp Leu Met Gln Lys Leu
    2255   2260   2265

Glu His Ala Lys Glu Ile Thr Glu Val Ala Lys Gly Thr Leu Lys
    2270   2275   2280

Asp Phe Thr Ala Gln Ser Thr Gln Val Glu Lys Phe Ile Asn Asp
    2285   2290   2295

Ile Thr Thr Trp Phe Thr Lys Val Glu Glu Ser Leu Met Asn Cys
    2300   2305   2310

Ala Gln Asn Glu Thr Cys Glu Ala Leu Lys Lys Val Lys Asp Ile
    2315   2320   2325

Gln Lys Glu Leu Gln Ser Gln Gln Ser Asn Ile Ser Ser Thr Gln
    2330   2335   2340

Glu Asn Leu Asn Ser Leu Cys Arg Lys Tyr His Ser Ala Glu Leu
    2345   2350   2355

Glu Ser Leu Gly Arg Ala Met Thr Gly Leu Ile Lys Lys His Glu
    2360   2365   2370

Ala Val Ser Gln Leu Cys Ser Lys Thr Gln Ala Ser Leu Gln Glu
    2375   2380   2385

Ser Leu Glu Lys His Phe Ser Glu Ser Met Gln Glu Phe Gln Glu
    2390   2395   2400

Trp Phe Leu Gly Ala Lys Ala Ala Ala Lys Glu Ser Ser Asp Arg
    2405   2410   2415

Thr Gly Asp Ser Lys Val Leu Glu Ala Lys Leu His Asp Leu Gln
    2420   2425   2430

Asn Ile Leu Asp Ser Val Ser Asp Gly Gln Ser Lys Leu Asp Ala
    2435   2440   2445

Val Thr Gln Glu Gly Gln Thr Leu Tyr Ala His Leu Ser Lys Gln
    2450   2455   2460

Ile Val Ser Ser Ile Gln Glu Gln Ile Thr Lys Ala Asn Glu Glu
    2465   2470   2475

Phe Gln Ala Phe Leu Lys Gln Cys Leu Lys Asp Lys Gln Ala Leu
    2480   2485   2490

Gln Asp Cys Ala Ser Glu Leu Gly Ser Phe Glu Asp Gln His Arg
    2495   2500   2505

Lys Leu Asn Leu Trp Ile His Glu Met Glu Glu Arg Phe Asn Thr
    2510   2515   2520

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Glu Asn Leu Gly Glu Ser Lys Gln His Ile Pro Glu Lys Lys Asn
2525   2530   2535

Glu Val His Lys Val Glu Met Phe Leu Gly Glu Leu Leu Ala Ala
2540   2545   2550

Arg Glu Ser Leu Asp Lys Leu Ser Gln Arg Gly Gln Leu Leu Ser
2555   2560   2565

Glu Glu Gly His Gly Ala Gly Gln Glu Gly Arg Leu Cys Ser Gln
2570   2575   2580

Leu Leu Thr Ser His Gln Asn Leu Leu Arg Met Thr Lys Glu Lys
2585   2590   2595

Leu Arg Ser Cys Gln Val Ala Leu Gln Glu His Glu Ala Leu Glu
2600   2605   2610

Glu Ala Leu Gln Ser Met Trp Phe Trp Val Lys Ala Ile Gln Asp
2615   2620   2625

Arg Leu Ala Cys Ala Glu Ser Thr Leu Gly Ser Lys Asp Thr Leu
2630   2635   2640

Glu Lys Arg Leu Ser Gln Ile Gln Asp Ile Leu Leu Met Lys Gly
2645   2650   2655

Glu Gly Glu Val Lys Leu Asn Met Ala Ile Gly Lys Gly Glu Gln
2660   2665   2670

Ala Leu Arg Ser Ser Asn Lys Glu Gly Gln Arg Val Ile Gln Thr
2675   2680   2685

Gln Leu Glu Thr Leu Lys Glu Val Trp Ala Asp Ile Met Ser Ser
2690   2695   2700

Ser Val His Ala Gln Ser Thr Leu Glu Ser Val Ile Ser Gln Trp
2705   2710   2715

Asn Asp Tyr Val Glu Arg Lys Asn Gln Leu Glu Gln Trp Met Glu
2720   2725   2730

Ser Val Asp Gln Lys Ile Glu His Pro Leu Gln Pro Gln Pro Gly
2735   2740   2745

Leu Lys Glu Lys Phe Val Leu Leu Asp His Leu Gln Ser Ile Leu
2750   2755   2760

Ser Glu Ala Glu Asp His Thr Arg Ala Leu His Arg Leu Ile Ala
    2765   2770   2775

Lys Ser Arg Glu Leu Tyr Glu Lys Thr Glu Asp Glu Ser Phe Lys
    2780   2785   2790

Asp Thr Ala Gln Glu Glu Leu Lys Thr Gln Phe Asn Asp Ile Met
    2795   2800   2805

Thr Val Ala Lys Glu Lys Met Arg Lys Val Glu Glu Ile Val Lys
    2810   2815   2820

Asp His Leu Met Tyr Leu Asp Ala Val His Glu Phe Thr Asp Trp
    2825   2830   2835

Leu His Ser Ala Lys Glu Glu Leu His Arg Trp Ser Asp Met Ser
    2840   2845   2850

Gly Asp Ser Ser Ala Thr Gln Lys Lys Leu Ser Lys Ile Lys Glu
    2855   2860   2865

Leu Ile Asp Ser Arg Glu Ile Gly Ala Ser Arg Leu Ser Arg Val
    2870   2875   2880

Glu Ser Leu Ala Pro Glu Val Lys Gln Asn Thr Thr Ala Ser Gly
    2885   2890   2895

Cys Glu Leu Met His Thr Glu Met Gln Ala Leu Arg Ala Asp Trp
    2900   2905   2910

Lys Gln Trp Glu Asp Ser Val Phe Gln Thr Gln Ser Cys Leu Glu
    2915   2920   2925

Asn Leu Val Ser Gln Met Ala Leu Ser Glu Gln Glu Phe Ser Gly
    2930   2935   2940

Gln Val Ala Gln Leu Glu Gln Ala Leu Glu Gln Phe Ser Ala Leu
    2945   2950   2955

Leu Lys Thr Trp Ala Gln Gln Leu Thr Leu Leu Glu Gly Lys Asn
    2960   2965   2970

Thr Asp Glu Glu Ile Val Glu Cys Trp His Lys Gly Gln Glu Ile
    2975   2980   2985

Leu Asp Ala Leu Gln Lys Ala Glu Pro Arg Thr Glu Asp Leu Lys

2990   2995   3000

Ser Gln Leu Asn Glu Leu Cys Arg Phe Ser Arg Asp Leu Ser Thr
    3005   3010   3015

Tyr Ser Gly Lys Val Ser Gly Leu Ile Lys Glu Tyr Asn Trp
    3020   3025   3030